



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2021-1164; Project Identifier MCAI-2021-00975-E]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc) Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to supersede airworthiness directive (AD) 2020-20-07 which applies to all Rolls-Royce Deutschland Ltd & Co KG (RRD) Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3, Trent 1000-R3, Trent 7000-72, and Trent 7000-72C model turbofan engines. AD 2020-20-07 requires initial and repetitive borescope inspections (BSIs) or visual inspections of the intermediate-pressure compressor (IPC) shaft assembly and, depending on the results of the inspection, replacement of the IPC shaft assembly. Since the FAA issued AD 2020-20-07, RRD provided optional terminating actions for the required repetitive inspections and alternative inspection instructions. This proposed AD would continue to require initial and repetitive BSIs but would allow modification of the engine in accordance with Rolls-Royce service information as a terminating action to these inspections, as specified in a European Union Aviation Safety Agency (EASA) AD, which is proposed for incorporation by reference (IBR). The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <https://www.regulations.gov>. Follow the instructions for submitting comments.

- Fax: (202) 493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For material that is proposed for IBR in this AD, contact EASA, Konrad-Adenauer-Ufer 3, 50668 Cologne, Germany; phone: +49 221 8999 000; email: ADs@easa.europa.eu; website: <https://www.easa.europa.eu>. You may find this IBR material on the EASA website at <https://ad.easa.europa.eu>. You may view this IBR material at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110. The EASA material is also available at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-1164.

Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-1164; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, the EASA AD, any comments received, and other information. The street address for Docket Operations is listed above.

FOR FURTHER INFORMATION CONTACT: Nicholas Paine, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7116; email: Nicholas.J.Paine@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include “Docket No. FAA-2021-1164; Project Identifier MCAI-2021-00975-E” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this proposal because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to <https://www.regulations.gov>, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public

docket of this NPRM. Submissions containing CBI should be sent to Nicholas Paine, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803. Any commentary that the FAA receives that is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA issued AD 2020-20-07, Amendment 39-21263 (85 FR 62975, October 6, 2020) (AD 2020-20-07), for all RRD Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3, Trent 1000-R3, Trent 7000-72, and Trent 7000-72C model turbofan engines. AD 2020-20-07 was prompted by a report of crack findings in the front air seal on the IPC shaft assembly during the stripping of a flight test engine. AD 2020-20-07 requires initial and repetitive BSIs or visual inspections of the IPC shaft assembly and, depending on the results of the inspection, replacement of the IPC shaft assembly with a part eligible for installation. The agency issued AD 2020-20-07 to prevent failure of the IPC shaft assembly, which could result in loss of thrust control and reduced control of the airplane.

Actions Since AD 2020-20-07 was Issued

Since the FAA issued AD 2020-20-07, EASA, which is the Technical Agent for the Member States of the European Union, has issued EASA AD 2019-0282R1, dated August 25, 2021 (EASA AD 2019-0282R1), to correct an unsafe condition for all RRD Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3, Trent 1000-R3, Trent 7000-72, and Trent 7000-72C model turbofan engines.

RRD also published Rolls-Royce Trent 1000 Service Bulletin (SB) 72-K570, Initial Issue, dated June 15, 2021 (Rolls-Royce Trent 1000 SB 72-K570); and Rolls-

Royce Trent 1000 SB 72-K571, Initial Issue, dated June 15, 2021 (Rolls-Royce Trent 1000 SB 72-K571). This service information introduces optional terminating actions for the repetitive inspections and an alternative method for the repetitive BSIs of the IPC shaft assembly.

See EASA AD 2019-0282R1 for additional background information.

Explanation of Retained Requirements

Although this proposed AD does not explicitly restate the requirements of AD 2020-20-07, this proposed AD would retain all the requirements of AD 2020-20-07. Those requirements are referenced in EASA AD 2019-0282R1, which, in turn, is referenced in paragraph (g) of this proposed AD.

FAA's Determination

These engines have been approved by EASA and are approved for operation in the United States. Pursuant to the FAA's bilateral agreement with the European Community, the FAA has been notified about the unsafe condition described in the MCAI. The FAA is issuing this NPRM after evaluating all known relevant information and determining that the unsafe condition described previously is likely to exist or develop on other engines of the same type design.

Related Service Information under 1 CFR Part 51

The FAA reviewed EASA AD 2019-0282R1. EASA AD 2019-0282R1 describes actions for initial and repetitive BSIs of the IPC shaft assembly. This material is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

Other Related Service Information

The FAA reviewed Rolls-Royce Trent 1000 Alert Non-Modification Service Bulletin (NMSB) 72-AK451, Revision 1, dated July 15, 2021 (Rolls-Royce Trent 1000

Alert NMSB 72-AK451); Rolls-Royce Trent 1000 SB 72-K570; and Rolls-Royce Trent 1000 SB 72-K571.

Rolls-Royce Trent 1000 Alert NMSB 72-AK451 describes procedures for initial and repetitive BSIs of the IPC shaft assembly. Rolls-Royce Trent 1000 SB 72-K570 and Rolls-Royce Trent 1000 SB 72-K571, differentiated by engine model, describe procedures for the modification of the engine as a terminating action to the initial and repetitive BSIs of the IPC shaft assembly.

Proposed AD Requirements in this NPRM

This proposed AD would retain all the requirements of AD 2020-20-07. This proposed AD would require compliance with the required actions from November 10, 2020, the effective date of AD 2020-20-07. This proposed AD would also allow modification of the engine in accordance with Rolls-Royce service information as a terminating action to the initial and repetitive BSIs of the IPC shaft assembly. This proposed AD would also require accomplishing the actions specified in EASA AD 2019-0282R1, described previously, as incorporated by reference, except for any differences identified as exceptions in the regulatory text of this proposed AD and except as discussed under “Differences Between this Proposed AD and the EASA AD.”

Explanation of Required Compliance Information

In the FAA’s ongoing efforts to improve the efficiency of the AD process, the FAA initially worked with Airbus and EASA to develop a process to use certain EASA ADs as the primary source of information for compliance with requirements for corresponding FAA ADs. The FAA has since coordinated with other manufacturers and civil aviation authorities (CAAs) to use this process. As a result, the FAA proposes to incorporate EASA AD 2019-0282R1 in the FAA final rule. This proposed AD would require compliance with EASA AD 2019-0282R1 in its entirety through that incorporation, except for any differences identified as exceptions in the regulatory text of

this proposed AD. Using common terms that are the same as the heading of a particular section in EASA AD 2019-0282R1 does not mean that operators need comply only with that section. For example, where the AD requirement refers to “all required actions and compliance times,” compliance with this AD requirement is not limited to the section titled “Required Action(s) and Compliance Time(s)” in EASA AD 2019-0282R1. Service information specified by EASA AD 2019-0282R1 that is required for compliance with it will be available at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-1164 after the FAA final rule is published.

Differences Between this Proposed AD and the EASA AD

Where EASA AD 2019-0282R1 requires compliance from the effective date of EASA AD 2019-0282, this proposed AD requires compliance from the effective date of FAA AD 2020-20-07. Where EASA AD 2019-0282R1 requires contacting Rolls-Royce for approved corrective actions if a crack is detected during any on-wing inspection and in-shop inspection, this proposed AD requires removing the part and installing a serviceable part.

Where EASA AD 2019-0282R1 defines a serviceable part as an IPC shaft assembly which is not an affected part; or an affected part which is new (never previously installed on an engine); or an affected part that, before (re)installation, has passed (no crack detected) an inspection in accordance with the instructions of the NMSB, this proposed AD includes in that definition an IPC shaft assembly that, before (re)installation, has passed a visual inspection (no crack detected) of the exposed part using FAA-approved maintenance procedures.

Where EASA AD 2019-0282R1 references on-wing inspections, a visual inspection of the IPC shaft assembly using FAA-approved maintenance procedures may be substituted for any on-wing borescope inspection if the affected part is exposed, and provided that the compliance times specified in this proposed AD are not exceeded.

This proposed AD does not mandate compliance with the “Remarks” section of EASA AD 2019-0282R1.

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 22 engines installed on airplanes of U.S. Registry.

The FAA estimates the following costs to comply with this proposed AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
BSI or visual inspection of IPC shaft assembly	3.5 work-hours x \$85 per hour = \$297.50	\$0	\$297.50	\$6,545

The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the proposed inspection. The agency has no way of determining the number of aircraft that might need this replacement:

On-condition costs

Action	Labor Cost	Parts Cost	Cost per product
Replace IPC shaft assembly	1,080 work-hours x \$85 per hour = \$91,800	\$1,365,219	\$1,457,019

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA’s authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency’s authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds

necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

- 2. The FAA amends § 39.13 by:

- a. Removing Airworthiness Directive (AD) 2020-20-07, Amendment 39-21263

(85 FR 62975, October 6, 2020); and

b. Adding the following new AD:

Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc): Docket No. FAA-2021-1164; Project Identifier MCAI-2021-00975-E.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD replaces AD 2020-20-07, Amendment 39-21263 (85 FR 62975, October 6, 2020) (AD 2020-20-07).

(c) Applicability

This AD applies to Rolls-Royce Deutschland Ltd & Co KG (RRD) Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3, Trent 1000-R3, Trent 7000-72, and Trent 7000-72C model turbofan engines installed as identified in EASA AD 2019-0282R1, Revision 1, dated August 25, 2021 (EASA AD 2019-0282R1).

(d) Subject

Joint Aircraft Service Component (JASC) Code 7230, Turbine Engine Compressor Section.

(e) Unsafe Condition

This AD was prompted by a report of crack findings in the front air seal on the intermediate-pressure compressor (IPC) shaft assembly during the stripping of a flight test engine. The FAA is issuing this AD to prevent failure of the IPC shaft assembly. The

unsafe condition, if not addressed, could result in loss of thrust control and reduced control of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

Except as specified in paragraph (h) of this AD: Perform all required actions within the compliance times specified in, and in accordance with, EASA AD 2019-0282R1.

(h) Exceptions to EASA AD 2019-0282R1

(1) Where EASA AD 2019-0282R1 requires compliance from November 27, 2019, the effective date of EASA AD 2019-0282, this AD requires compliance from November 10, 2020, the effective date of FAA AD 2020-20-07.

(2) Where EASA AD 2019-0282R1 requires contacting Rolls-Royce for approved corrective actions if a crack is detected during any on-wing inspection and in-shop inspection, this AD requires removing the IPC shaft assembly and replacing it with a part eligible for installation before further flight.

(3) Where EASA AD 2019-0282R1 defines a serviceable part as an IPC shaft assembly which is not an affected part; or an affected part which is new (never previously installed on an engine); or an affected part that, before (re)installation, has passed (no crack detected) an inspection in accordance with the instructions of the NMSB, this AD also includes in that definition an IPC shaft assembly that, before (re)installation, has passed a visual inspection (no crack detected) of the exposed part using FAA-approved maintenance procedures.

(4) Where EASA AD 2019-0282R1 references on-wing inspections, this AD allows for a visual inspection of the IPC shaft assembly using FAA-approved maintenance procedures as a substitute for any on-wing borescope inspection if the

affected part is exposed, provided that the compliance times specified in this AD are not exceeded.

(5) This AD does not mandate compliance with the “Remarks” section of EASA AD 2019-0282R1.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ECO Branch, send it to the attention of the person identified in paragraph (j)(2) of this AD. Information may be emailed to: ANE-AD-AMOC @faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(j) Related Information

(1) For more information about EASA AD 2019-0282R1, contact EASA, Konrad-Adenauer-Ufer 3, 50668 Cologne, Germany; phone: +49 221 8999 000; email: ADs@easa.europa.eu; website: <https://www.easa.europa.eu>. You may find this material on the EASA website at <https://ad.easa.europa.eu>. You may view this material at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110. This material may be found in the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-1164.

(2) For more information about this AD, contact Nicholas Paine, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7116; email: Nicholas.J.Paine@faa.gov.

(3) For RRD service information identified in this AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: +44 (0)1332 242424 fax: +44 (0)1332 249936; website: <https://www.rolls-royce.com/contact-us.aspx>. You may view this material at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

Issued on December 20, 2021.

Lance T. Gant, Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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